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PATENT APPLICATION

UNITED STATES PATENT AND TRADEMARK OFFICE

In re the application of:

Attorney Docket No.: 1657.55US01

Huang et al.

Application No.: 10/073,666

Filed: February 11, 2002

Group Art Unit: 2614

For: INTEGRABLE NAVAL VIRTUAL TARGET RANGE SYSTEM

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PRELIMINARY AMENDMENT

Assistant Commissioner for Patents  
Washington, D.C. 20231

Sir:

Prior to examination, please amend the above-identified application as follows:

In the Title

Please substitute the following amended title for the title as currently on record:

NAVAL VIRTUAL TARGET RANGE SYSTEM

Specification As Amended

Please substitute the following amended paragraph(s) and/or section(s):

Page 3, lines 3-19:

The United States Navy has experimented with solutions of its own. One solution uses a flat view of a simulated island on weapon system displays as a virtual target range to support live fire exercises. This kind of simulation has been used at the United States Naval Pacific Missile

Range Facility at Barking Sands in Kauai, Hawaii. This facility uses an array of fixed survey buoys anchored at pre-determined offshore locations. A graphic of an island (topographic map) is then "overlaid" onto the buoys' global coordinates on a map or display, and naval weapon systems are directed to fire at particular locations on the virtual island. Sensors on the buoys record the impacts of rounds on the water. The sensor data for each buoy includes a time-stamp and location of the respective buoy, and is communicated back to a central processing station where the data is used to compute the trajectory of a round and the impact point of the round. From this information, a virtual impact point with respect to the previously implemented, flat virtual target range is calculated and overlain onto the target range. Another example is the Potomac River Test Range of the United States Naval Surface Weapon Center Dahlgren Division. This facility superimposes a flat image of the north end of San Clemente Island over an impact area defined on the Potomac River using an IMPASS buoy system whereby each buoy is free-floating and equipped with a hydro-phonic sensor and global positioning system.

Page 5, lines 5-15:

The target system can be used for simulated fire while a ship is in a harbor or dockside, or for simulated or live fire during a voyage or in a designated target area. The target system thus allows for anytime-anywhere training and minimizes or eliminates travel to and from a training facility. To maximize training efficiency, the target system can use available terrain databases to implement life-like, virtual, three-dimensional graphical views of geographic formations, such as virtual islands or virtual coastline, and can use available databases of physical objects to implement three-dimensional views of targets to be overlain on the geographic formations. By enabling three-dimensional graphical views of virtual target ranges, the target system can more accurately calculate results of a fire exercise and can be used to effectively train spotters as well as other naval personnel in a near realistic environment.

REMARKS

Claims 1-26 are pending in the application.

The title has been amended to more clearly describe the invention.

The specification has been amended to correct obvious typographical and grammatical errors. No new matter has been added.

In view of the foregoing, it is submitted that this application is in condition for allowance.

Favorable consideration and prompt allowance of the application are respectfully requested.

The Examiner is invited to telephone the undersigned if the Examiner believes it would be useful to advance prosecution.

Respectfully submitted,



Brad Pedersen  
Registration No. 32,432

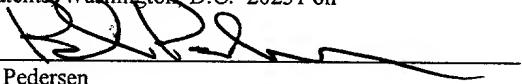
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Brad Pedersen

**ATTACHMENT  
REDLINED AMENDMENT**

Title As Amended

Please substitute the following amended title for the title as currently on record.

[INTEGRABLE] NAVAL VIRTUAL TARGET RANGE SYSTEM

Specification As Amended

Please substitute the following amended paragraph(s) and/or section(s):

Page 3, lines 3-19:

The United States Navy has experimented with solutions of its own. One solution uses a flat view of a simulated island on weapon system displays as a virtual target range to support live fire exercises. This kind of simulation has been used at the United States Naval Pacific Missile Range Facility at Barking [Sounds] Sands in [Kuala] Kauai, Hawaii. This facility uses an array of fixed survey buoys anchored at pre-determined offshore locations. A graphic of an island (topographic map) is then "overlaid" onto the buoys' global coordinates on a map or display, and naval weapon systems are directed to fire at particular locations on the virtual island. Sensors on the buoys record the impacts of rounds on the water. The sensor data for each buoy includes a time-stamp and location of the respective buoy, and is communicated back to a central processing station where the data is used to compute the trajectory of a round and the impact point of the round. From this information, a virtual impact point with respect to the previously implemented, flat virtual target range is calculated and overlain onto the target range. Another example is the Potomac River Test Range of the United States Naval Surface Weapon Center Dahlgren Division. This facility superimposes a flat image of the north end of San Clemente Island over an impact area defined on the Potomac River using an IMPASS buoy system

whereby each buoy is free-floating and equipped with a hydro-phonic sensor and global positioning system.

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The target system can be used for simulated fire while a ship is in a harbor or dockside, or for simulated or live fire during a voyage or in a designated target area. The target system thus allows for anytime-anywhere training and minimizes or eliminates travel to and from a training facility. To maximize training efficiency, the target system can use available terrain databases to implement [live]life-like, virtual, three-dimensional graphical views of geographic formations, such as virtual islands or virtual coastline, and can use available databases of physical objects to implement three-dimensional views of targets to be overlain on the geographic formations. By enabling three-dimensional graphical views of virtual target ranges, the target system can more accurately calculate results of a fire exercise and can be used to effectively train spotters as well as other naval personnel in a near realistic environment.